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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

NGUYEN, KIET TUAN

ART UNIT	PAPER NUMBER
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2881

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,103	<b>Applicant(s)</b> VAN DER WERF ET AL.	
	<b>Examiner</b> Kiet T. Nguyen	<b>Art Unit</b> 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 October 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 19-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-18 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/934,681.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/8/04, 8/15/05</u> . | 6) <input type="checkbox"/> Other: _____  |

Applicant's election of Group I including claims 1-18 in the reply filed on 21 October 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicant therefore is requested to cancel the non-elected claims 19-32.

***Rejection Under 35 U.S.C. 102(b)***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Wittekoek et al. (5,144,363).

Wittekoek et al. (5,144,363) disclose, in figs. 1a-13, an alignment system for a lithographic apparatus. The system includes a radiation sensor DE3, DE4, which includes a radiation sensitive material (a luminescent plate LP3, LP4 in fig. 9) for converting a beam of alignment radiation having a short wavelength into a secondary beam radiation having a longer wavelength (see col. 21, lines 8-19); a plurality of an array detector DT3-DT14 for detecting the secondary radiation emerging from the radiation sensitive material LP3, LP4 and for providing an output signal to align marks M1, M2 on mask MA and marks P1, P2 on a wafer; and a position monitoring unit IF1, IF2 which is an interferometer and a controller IC for controlling a stage position WT. The wavelength of the alignment radiation that is smaller than 50 nm is considered to be

Art Unit: 2881

inherent in the Wittekoek et al. (5,144,363) system, as Wittekoek et al. (5,144,363) disclose using the projection beam, having a wavelength of 130 nm (see col. 7, lines 48-53), which is of the order of 2.5-3.2 times the wavelength of the alignment beam (see col. 4, lines 47-49).

***Rejection Under 35 U.S.C. 103(a)***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 4, 8-13, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wittekoek et al. (5,144,363) in view of Firtz et al. (3,745,358) and Wuest et al. (5,349,194).

Wittekoek et al. (5,144,363) disclose all the features as discussed above except a compound selected from the group comprising CaS:Ce, YAG:Ce, ZnS:Ag, and Al as

Art Unit: 2881

recited in claim 4; at least part of the radiation sensor carried by a substrate holder as recited in claim 8; the electrons freed from the radiation sensitive material as recited in claim 9; a measuring device electrically connected to the radiation sensitive material for measuring an electrical current induced by further electrons replacing the freed electrons as recited in claim 10; a collector for collecting the freed electrons as recited in claims 11 and 15; an electrical field strength between the radiation sensitive material and the collector as recited in claim 13; a measuring device connected to the collector for measuring an electrical current induced by the collected electrons as recited in claim 15; and the radiation sensitive material comprising at least a portion of a substrate having the alignment mark as recited in claim 18.

Firtz et al. (3,745,358) disclose, in figs. 1-10, an alignment apparatus for electron projection systems. The apparatus includes a collector 50, which is made of aluminum material and is an alignment mark on a wafer 34 carried by a holder for collecting freed electrons from a mask 32 (see col. 5, lines 40-68); an electrical field strength of a power supply 56; and a measuring device (see fig. 2A) for measuring an electrical current induced by electrons. Therefore, it would have been obvious to one skilled in the art to use the collector and the measuring device in the Wittekoek et al. (5,144,363) for aligning the projection system.

Wuest et al. (5,349,194) disclose, in figs. 1-2, an ultraviolet detector having a radiation sensitive material 14 for providing freed electrons; a collector 13 for collecting the freed electrons; a power supply 17 for providing an electrical field strength between the radiation sensitive material 14 and the collector 13; and a measuring device 18 for

Art Unit: 2881

measuring an electrical current induced by the electrons. Therefore, it would have been obvious to one skilled in the art to use the ultraviolet detector in the Wittekoek et al. (5,144,363) for aligning the projection system.

Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Reasons for indicating allowable subject matter**

The prior art fails to disclose an alignment system for a lithographic apparatus, including a radiation sensor having an electrical field strength that is larger than 50V/cm between a radiation sensitive material and a collector as recited in claim 14.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Mayer et al. (4,540,277) disclose a projection system having a photodetector for aligning marks;

2) Nicoli et al. (5,461,226) disclose an ultraviolet sensor ; and

3) Van der Werf et al. (5,910,847) disclose an apparatus for determining a radiation dose.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiet T. Nguyen whose telephone number is 571-272-2479. The examiner can normally be reached on Monday-Friday 8-6.

Art Unit: 2881

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KN



KIET T. NGUYEN  
PRIMARY EXAMINER